

Mercury exposure in coastal communities of Kedah and Kelantan, Malaysia.

Abstract

A cross-sectional study of mercury concentration in hair was conducted in two rural coastal communities of Yan (state of Kedah) and Bachok (state of Kelantan) from March to May 2006. For the comparative groups, the urban communities of Alor Setar (Kedah) and Kota Bharu (Kelantan) were chosen. This study was carried out in collaboration with the National Institute for Minamata Disease (NIMD), Minamata, Japan. A total of 201 hair samples were collected from the residents. Samples were analyzed by the NIMD, using the oxygen combustion-gold combustion method. The geometric means for total mercury in each district were 1.38 ppm (Yan), 1.20 ppm (Alor Setar), 1.24 ppm (Bachok) and 1.07 ppm (Kota Bharu). Two persons, each from Alor Setar and Kota Bharu, had high total mercury (washed sample 223.58 ppm and 803.16 ppm respectively). However, further analysis for methyl mercury showed that the levels were within 1.36 ppm and 1.91 ppm, respectively. Of the ten exposure parameters tested, only age ($p < 0.001$) and fish consumption ($p < 0.01$) appeared to have significant effect on hair mercury levels. Concerns about mercury were related to a severe outbreak of neurological disease in Minamata, Japan. In 1950s, a huge amount of methyl mercury (MeHg) formed in the chemical factory had been discharged to the Minamata Bay. Although inorganic mercury (I-Hg) was also discharged, contribution of biomethylation is considered too small for the Minamata disease. Bioaccumulation of MeHg into the aquatic food chain resulted in the neurological syndrome in adults who has eaten contaminated fish and prenatal exposures to MeHg from maternal consumption of fish which resulted in mental retardation, seizures and cerebral palsy (ATSDR, 1999; and Harada et al., 1999).

Keyword: Coastal; Communities; Comparative; Collaboration; Samples; Analyzed; Combustion; Parameters; Consumption; Contribution; Retardation; Contaminated.